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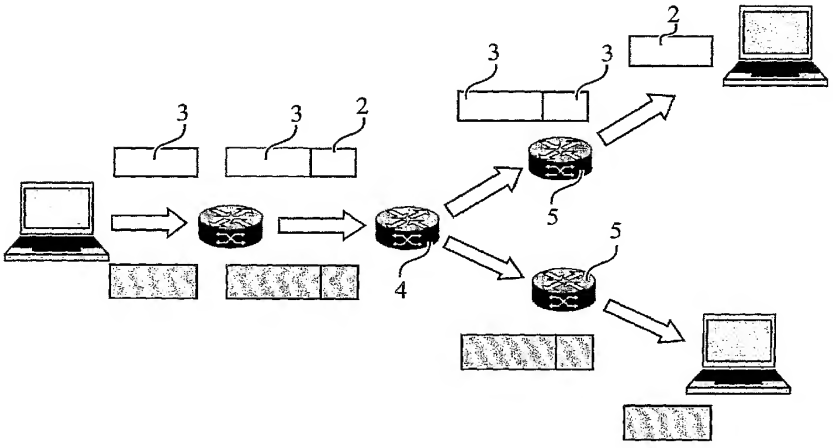
(54) Title: OPTICAL DEVICE FOR SIMULTANEOUSLY GENERATING AND PROCESSING OPTICAL CODES

$$\left|T_{sk}(f)\right| = \prod_{v=0}^{V-1} \left|F_v\left(a_v f + \frac{S_{sk}}{N_k \tau}\right)\right| \qquad (I)$$



(57) Abstract: The invention relates to an optical device, apt to generate and process optical codes at least one wavelength, comprising *P*inputs s, with $1 \leq s \leq P$, and $P \geq 1$, and N outputs k, with $1 \leq k \leq N$ and $N \geq 1$, characterised in that it is apt to simultaneously generate and process $N_c \geq 2$, made of C chips with time interval τ, with $C \geq 2$, characterised in that the transfer function T_{sk} (f) from the input s to the output k satisfies the following formula: where: F_v is a transfer function of an optical filter, for v=0,1..., V-1, a_v is a constant value, for v=0,1,..., V-1 S_{sk} is an integer number ($S_{sk} \varepsilon Z$), N_k is a constante value, for k=2,...N, and V is a positive integer number with $1 \leq V \leq \log_2 N$. The invention further relates to a set of optical codes, apt to be generated, in particular, by such optical device, and to networks and apparatus comprising such optical device.

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